

Chapter 11 Concrete Report

11-1. General

a. Policy. A concrete report will be completed at the conclusion of construction on any major concrete structure such as a concrete dam, lock, or any project that is unique or unusual. The specific requirements for concrete report are outlined in ER 1110-2-402, "Concrete Reports." The concrete report will serve the dual purpose of meeting the requirements of ER 1110-2-100, "Periodic Inspection and Continuing Evaluation of Completed Civil Works Structures," for engineering data retained at the project site and advancing the state of the art of constructing large concrete structures by providing personnel working on subsequent projects with a discussion of problems encountered and solutions devised.

b. Author. The concrete report should be completed by personnel who are familiar with the project preferably the concrete engineer assigned to the project. Personnel from the engineering division should contribute to the report in any areas where they have special knowledge.

c. Timing. The report should be written as the project progresses so that important information is not lost as personnel changes occur. The report should be completed within 120 days of substantial completion of concrete placing.

11-2. Content

a. Outline. The concrete report should be written to fulfill the objectives of providing information to those who may investigate problems with concrete on the project in the future, those embarking on the design of a similar project, or those periodically inspecting the project. The concrete report should include discussions of problems encountered in each phase of concrete production and placement, including the production of aggregates. The solutions to these problems should be summarized. The typical outline provided in Table 11-1 should serve as a guide in the preparation of the concrete report.

b. Detailed instruction. The information to be included in the concrete report are discussed in accordance with the outline listed in Table 11-1.

(1) Introduction. The introduction of the report should state the purpose of the report, its scope, and the authority for the document in accordance with ER 1110-2-402,

"Concrete Reports" In addition, the report should include a project description and a location and vicinity map to serve as a guide independent of other project documents. The introduction should also include a summary table of the quantities of each major type of concrete on the project, i.e. interior mass, exterior mass, structural, tremie, backfill, etc.

(2) Aggregate sources. Each aggregate source used for concrete on the project should be provided by name, coordinates, and/or street or township of the pit or quarry. If test data are available in TM 6-370 (USA EWES 1953), the volume, area, and index numbers should be provided. Drawings or photographs should be provided to indicate the exact location within the pit or quarry from which the aggregate was produced.

(3) Aggregate production.

(a) Pit or quarry operation. This section discusses the removal of material from the pit or quarry including the make, model, and capacity of the primary equipment. In case of a quarry, the most commonly used blasting pattern should be detailed to include blast hole spacing and depth, powder types and requirements, and powder factor. Photographs should be used to the maximum extent to show the equipment and operation.

(b) Fine aggregate production. Photographs and a flow chart should be included showing the sequential processing of the fine aggregate. The major equipment used in the fine aggregate production should be listed by make, model, and capacity.

(c) Coarse aggregate production. Photographs and a flow chart should be included showing the sequential processing of the coarse aggregate. The major equipment used should be listed by make, model, and capacity. The particle shape should be discussed. In this regard, closeup photographs of the various stockpiles are most helpful. Readily visible and identifiable objects such as pens, hardhats, or rules should be placed nearby to provide scale. If spray bars or wood pickers are required, this should be noted.

(d) Stockpiling and handling. The number of stockpiles and the sizes of aggregate in each stockpile should be noted. The approximate size of the stockpile during normal aggregate production and concrete placing should be noted. Photographs or drawings are preferred for this purpose. If a stockpile was reduced to a very low level during the placing of concrete, the time of this occurrence should be noted. The equipment used to move aggregate to and from the stockpile should be noted.

Table 11-1
Concrete Report - Typical Outline

1. Introduction.
 - a. Purpose, scope, and authority
 - b. Project description
 - c. Concrete quantities by type
 - d. List of responsible personnel
2. Aggregate sources
 - a. General
 - b. Properties of sources used
3. Aggregate production
 - a. Pit or quarry operation
 - b. Fine aggregate production
 - c. Coarse aggregate production
 - d. Stockpiling and handling
4. Cementitious materials
 - a. Portland cement sources
 - b. Blended hydraulic cement sources
 - c. Pozzolan sources
 - d. GGBF slag
 - e. Silica fume
5. Chemical admixtures
 - a. Air-entraining admixtures
 - b. Water-reducing admixtures
 - c. Retarding admixtures
 - d. Accelerating admixtures
 - e. Others
6. Concrete batching and mixing plant(s)
7. Concrete mixtures used
 - a. Mass concrete
 - b. Structural concrete
 - c. Special concrete (RCC, fiber reinforced)
 - d. Shotcrete
8. Construction joint preparation

Table 11-1 (Continued)

9. Concrete transportation, placement, and consolidation
 - a. Concrete transportation
 - b. Concrete placement
 - c. Shotcrete placement
 - d. Concrete placing schedule
 - e. Concrete consolidation
 10. Concrete curing and protection
 11. Temperature control
 - a. Insulation
 - b. Precooling
 - c. Postcooling
 - d. Heating
 12. Special concretes
 - a. Fiber-reinforced concrete
 - b. Roller-compacted concrete
 - c. Tremie concrete placed in cutoff walls
 - d. Tremie concrete in underwater applications
 - e. Other unusual applications of material or means of placement
 13. Precast concrete
 14. Quality verification and testing
 - a. Government quality verification
 - b. Laboratory facilities
 15. Summary of test data
 - a. Aggregate quality tests
 - b. Aggregate grading tests
 - c. Tests of cementitious materials
 - d. Tests of admixtures
 - e. Concrete strength tests
 - f. Concrete F/T tests
 - g. Air content tests
 - h. Slump tests
 - i. Placing temperature
 - j. Resistance thermometer data
 16. Special problems
 - a. Problem
 - b. Actions
 - c. Comments
-

(4) Cementitious materials.

(a) Portland cement sources. The sources of portland cement used on the project should be noted as well as the dates they were used and the approximate locations of their use. The means of transporting the cement to the project site should be noted and the transfer and storage facilities described.

(b) Blended hydraulic cement sources. If blended hydraulic cement is used on the project, it should be discussed as described for portland cement in the previous paragraph.

(c) Pozzolan source. The sources of pozzolan used on the project should be listed. If commercial sources are used, the location of the firms supplying the pozzolan should be listed. If a source of natural pozzolan is developed and used by the Contractor or if a natural source is opened nearby by a commercial operator to supply pozzolan to the project, the location of the source should be provided and the processing requirements outlined.

(d) GGBF slag or silica fume. The sources of GGBF slag or silica fume, or both, if used, should be listed. Storage, handling, and batching facilities should be described. If they were used only in certain locations in the structures, the locations, dates placed, and mixture proportions should be included.

(5) Chemical admixtures. The brand name, sources, and available test data of all chemical admixtures used on the project should be listed as well as the structure feature in which they were used.

(6) Concrete batching and mixing plant. The concrete batching and mixing plant should be described to include make, model, and capacity of major bins, conveyor belts, hoppers, mixers, and controls. Photographs of the overall plant layout should be included.

(7) Concrete mixtures used. The proportions of the concrete mixtures used during the bulk of the placement of each major class of concrete should be tabulated. The aggregate batch weights should be reported at saturated surface dry. If significant field adjustments were made to the concrete mixtures that were supplied by the division laboratory being placed in a dam, power plant, lock, or other major water control structures, the extent of the adjustment should be noted and reasons for the adjustment discussed. If shotcrete is used on the project, the type of placement (wet or dry) should be noted and the type and capacity of equipment listed.

(8) Equipment and techniques. The equipment and techniques used for joint preparation should be described.

(9) Concrete transportation and placement. The type and capacity of equipment used to transport the concrete from the mixer to the placement site should be described. The means of placement should be described and the number and type of vibrators noted. The normal and maximum rates of placement of each major class of concrete on the project should be listed.

(10) Concrete curing and protection. A brief description should be provided outlining the Contractor's selected means of curing and protecting the concrete. Any mishaps which occurred during curing and protection which may have reduced the level of protection or truncated the curing process on parts of major structures should be noted.

(11) Temperature control. The description of the temperature control measures used on the project will include the types of insulation used, the major components of any required pre- or postcooling systems, the dates that various control measures were used during the construction period, and any mishaps which resulted in deviations from the specified temperature control requirements.

(12) Special concretes. On any project that includes concrete different than the usual cast-in-place mass or structural concrete, a section should be provided detailing the materials used, the method of placement, problems encountered, and how they were solved. Concrete applications which should be discussed include tremie concrete when placed in a major project element such as a cutoff wall, underwater foundation, or fiber-reinforced concrete.

(13) Precast concrete. The type, description, name, and location of the manufacturer of precast units used on the project should be provided.

(14) Quality verification and testing. The procedure and extent of the GQA program and the CQC program should be described. The types and frequencies of the tests and quality verifications performed by the Government should be listed. The facility used by the Government for GQA purposes and by the Contractor for CQC should be described.

(15) Summary of test data. The format for the presentation of data from the various quality assurance tests and quality control tests should be such that long tables of raw data are avoided. Charts should be used where possible. Charts and tables when used should show the

average of the values presented as well as the extremes and the specification limits. Use of computer programs for compiling and analyzing concrete data during construction is encouraged. The reports generated by these computer programs may be incorporated into the concrete report with minimum efforts. It is recommended that complete testing data stored in disks be included as enclosure for future use.

(16) Special problems. Any unusual problems encountered during the concrete construction and corrective actions taken should be described. Any comment or evaluation of the results should be provided or documented.